

Trigonometry

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Quantitative Aptitude

Chapter : Trigonometry

1) $\sec 45^\circ + \tan 30^\circ =$

SCCGL-22AUG-S2 : 69

- | | |
|-------------------------------|------------------------|
| (a) $(\sqrt{6} + 1)/\sqrt{3}$ | (b) $(1 + \sqrt{3})/2$ |
| (c) $(\sqrt{3} + 2)/\sqrt{3}$ | (d) $5/\sqrt{3}$ |

(2) If $\cos \theta = 5/13$, then $\operatorname{cosec} \theta = ?$

यदि $\cos \theta = 5/13$, तो $\operatorname{cosec} \theta = ?$

SCCGL-22AUG-S2 : 71

- | | | |
|-------------|------------|------------|
| (a) $5/12$ | (b) $12/5$ | (c) $13/5$ |
| (d) $13/12$ | | |

(3) What is the simplified value of $\sin^2(90 - \theta) - [\{\sin(90 - \theta)\sin \theta\}/\tan \theta]$ –

$\sin^2(90 - \theta) - [\{\sin(90 - \theta)\sin \theta\}/\tan \theta]$ का सरलीकृत मान क्या है?

SCCGL-08AUG-S2 : 69

- | | | |
|-------------------|-----------------------------------|-------|
| (a) 1 | (b) $\operatorname{cosec} \theta$ | (c) 0 |
| (d) $\cos \theta$ | | |

(4)

What is the simplified value of $\left[\frac{\cos^2 \theta}{1 + \sin \theta} - \frac{\sin^2 \theta}{1 + \cos \theta} \right]^2$?

$\left[\frac{\cos^2 \theta}{1 + \sin \theta} - \frac{\sin^2 \theta}{1 + \cos \theta} \right]^2$ का सरलीकृत मान क्या है?

SCCGL-08AUG-S2 : 70

- | | |
|------------------------|------------------------|
| (a) $\sin \theta$ | (b) $1 - \sin 2\theta$ |
| (c) $1 + \sin 2\theta$ | (d) $1 - \sin \theta$ |

(5) If $5 \sec \theta - 3 \tan \theta = 5$, then what is the value of $5 \tan \theta - 3 \sec \theta$?

यदि $5 \sec \theta - 3 \tan \theta = 5$, तो $5 \tan \theta - 3 \sec \theta$ का मान क्या होगा?

SCCGL-08AUG-S2 : 71

- | | | |
|-------|-------|-------|
| (a) 1 | (b) 2 | (c) 3 |
| (d) 4 | | |

(6) If $\sec^2 \theta + \tan^2 \theta = 5/3$, then what is the value of

$\tan 2\theta$?

यदि $\sec^2 \theta + \tan^2 \theta = 5/3$, तो $\tan 2\theta$ का मान क्या होगा?

SCCGL-08AUG-S3 : 69

- | | |
|------------------|--------------------------|
| (a) $2\sqrt{3}$ | (b) $\sqrt{3}$ |
| (c) $1/\sqrt{3}$ | (d) Cannot be determined |
- ज्ञात नहीं किया जा सकता

(7) A tower is broken at a point P above the ground. The top of the tower makes an angle 60° with the ground at Q. From another point R on the opposite side of Q angle of elevation of point P is 30° . If QR = 180 m, then what is the total height (in metres) of the tower?

एक मीनार, मैदान से ऊपर स्थित बिंदु P से टूट गया है। मीनार का ऊपरी सिरा बिंदु Q पर मैदान के साथ 60° का कोण बनाता है। बिंदु Q के विपरित दिशा में स्थित बिंदु R से बिंदु P का उन्नयन कोण 30° है। यदि QR = 180 मीटर है, तो मीनार की कुल ऊँचाई (मीटर में) कितनी है?

SCCGL-08AUG-S3 : 70

- | | | | |
|--------|------------------|------------------------|------------------------|
| (a) 90 | (b) $45\sqrt{3}$ | (c) $45(\sqrt{3} + 1)$ | (d) $45(\sqrt{3} + 2)$ |
|--------|------------------|------------------------|------------------------|

(8) If $\sin \theta + \sin 5\theta = \sin 3\theta$ and $0 < \theta < (\pi/2)$, then what is the value of θ (in degrees)?

यदि $\sin \theta + \sin 5\theta = \sin 3\theta$ तथा $0 < \theta < (\pi/2)$, तो θ का मान (डिग्री में) क्या होगा?

SCCGL-08AUG-S3 : 71

- | | | | |
|--------|--------|--------|-------------------|
| (a) 30 | (b) 45 | (c) 60 | (d) None of these |
|--------|--------|--------|-------------------|

(9) What is the simplified value of $(\cos A + \sin A)(\cot A + \tan A)$?

$(\cos A + \sin A)(\cot A + \tan A)$ का सरलीकृत मान क्या है?

SCCGL-10AUG-S1 : 69

- | | |
|---------------------------------------|---------------------------------------|
| (a) $\sec A + \operatorname{cosec} A$ | (b) $\sin A + \cos A$ |
| (c) $\tan A + \cot A$ | (d) $\sec A - \operatorname{cosec} A$ |

(10)

What is the simplified value of $\sqrt{\frac{\cosec A}{\cosec A - 1} + \frac{\cosec A}{\cosec A + 1}}$?

$\sqrt{\frac{\cosec A}{\cosec A - 1} + \frac{\cosec A}{\cosec A + 1}}$ का सरलीकृत मान क्या है?

SCCGL-10AUG-S1 : 70

- (a) $\sqrt{2} \sec A$ (b) $\sqrt{2} \cosec A$
 (c) $\sec^2 A$ (d) $2 \sec A$

(11) If $2 \cos \theta = 2 - \sin \theta$, then what is the value of $\cos \theta$?

यदि $2 \cos \theta = 2 - \sin \theta$, तो $\cos \theta$ का मान क्या होगा?

SCCGL-10AUG-S1 : 71

- (a) 1 or 3/5 (b) 1 or -1/2
 (c) -1 or -1/2 (d) -1 or 3/5

(12) What is the value of $\cot 60^\circ - \cos 45^\circ$?

$\cot 60^\circ - \cos 45^\circ$ का मान क्या है?

SCCGL-21AUG-S3 : 69

- (a) $(9 - 2\sqrt{3})/9$ (b) $(\sqrt{2} - \sqrt{3})/\sqrt{6}$
 (c) $(1 - 2\sqrt{3})/2$ (d) $(\sqrt{2} - \sqrt{3})/\sqrt{6}$

(13) If $\tan \theta = 9/40$, then $\sec \theta = ?$

यदि $\tan \theta = 9/40$, तो $\sec \theta = ?$

SCCGL-21AUG-S3 : 71

- (a) $40/41$ (b) $9/41$ (c) $41/40$
 (d) $41/9$

(14) What is the value of $[1/(1 - \tan \theta)] - [1/(1 + \tan \theta)]$?

$[1/(1 - \tan \theta)] - [1/(1 + \tan \theta)]$ का मान क्या है?

SCCGL-11AUG-S3 : 69

- (a) $\tan \theta$ (b) $\cot 2\theta$ (c) $\tan 2\theta$
 (d) $\cot \theta$

(15) If $\tan \theta + \cot \theta = x$, then what is the value of $\tan^2 \theta + \cot^2 \theta$?

यदि $\tan \theta + \cot \theta = x$ है, तो $\tan^2 \theta + \cot^2 \theta$ का मान क्या है?

SCCGL-11AUG-S3 : 70

- (a) $(x^2 - 3)^2 + 2$ (b) $(x^2 - 2x) + 4$
 (c) $x(x - 4) + 2$ (d) $x^2(x^2 - 4) + 2$

(16) If $\tan^2 \theta + \cot^2 \theta = 2$, then what is the value of $2^{\sec \theta}$?

यदि $\tan^2 \theta + \cot^2 \theta = 2$ है, तो $2^{\sec \theta}$ का मान क्या होगा?

SCCGL-11AUG-S3 : 71

- (a) 0 (b) 1 (c) 2
 (d) 4

(17) What is the simplified value of $\tan(\theta/2) + \cot(\theta/2)$?

$\tan(\theta/2) + \cot(\theta/2)$ का सरलीकृत मान क्या है?

SCCGL-05AUG-S3 : 69

- (a) 2 $\cosec \theta$ (b) 2 $\sec \theta$
 (c) $\sin \theta$ (d) $\cosec \theta$

(18) What is the simplified value of $[(\sec^3 x - \tan^3 x)/(\sec x - \tan x)] - 2 \tan^2 x - \sec x \tan x$?
 $[(\sec^3 x - \tan^3 x)/(\sec x - \tan x)] - 2 \tan^2 x - \sec x \tan x$ का सरलीकृत मान क्या है?

SCCGL-05AUG-S3 : 70

- (a) 0 (b) 2 (c) -1
 (d) 1

(19) If $\sin^8 \theta + \cos^8 \theta - 1 = 0$, then what is the value of $\cos^2 \theta \sin^2 \theta$ (if $\theta \neq 0$ or $\pi/2$)?

यदि $\sin^8 \theta + \cos^8 \theta - 1 = 0$ है, तो $\cos^2 \theta \sin^2 \theta$ का मान क्या है(यदि $\theta \neq 0$ या $\pi/2$)?

SCCGL-05AUG-S3 : 71

- (a) -1 (b) 0 (c) 1
 (d) 2

(20) What is the simplified value of $\sec^4 \theta - \sec^2 \theta$?
 $\sec^4 \theta - \sec^2 \theta \tan^2 \theta$ का सरलीकृत मान क्या है?

SCCGL-10AUG-S2 : 69

- (a) $\cosec^2 \theta$ (b) $\sec^2 \theta$
 (c) $\cot^2 \theta$ (d) $\sec \theta \tan \theta$

(21) What is the simplified value of $(\sin A - \cosec A)(\sec A - \cos A)(\tan A + \cot A)$?

$(\sin A - \cosec A)(\sec A - \cos A)(\tan A + \cot A)$ का सरलीकृत मान क्या है?

SCCGL-10AUG-S2 : 70

- (a) 1 (b) -1 (c) 0
 (d) 2

(22) If $(1/\cos \theta) - (1/\cot \theta) = 1/P$, then what is the value of $\cos \theta$?

यदि $(1/\cos \theta) - (1/\cot \theta) = 1/P$, तो $\cos \theta$ का मान क्या होगा?

SCCGL-10AUG-S2 : 71

- (a) $(P + 1)/(P - 1)$ (b) $(P^2 + 1)/2P$
 (c) $2(P^2 + 1)/P$ (d) $2P/(P^2 + 1)$

(23) What is the simplified value of $\cosec^6 A - \cot^6 A - 3 \cosec^2 A \cot^2 A$?

$\cosec^6 A - \cot^6 A - 3 \cosec^2 A \cot^2 A$ का सरलीकृत मान क्या है?

SCCGL-10AUG-S3 : 69

- (a) -2 (b) -1 (c) 0
 (d) 1

(24)

What is the simplified value of $\sqrt{\frac{\sec A - 1}{\sec A + 1}}$

$\sqrt{\frac{\sec A - 1}{\sec A + 1}}$ का सरलीकृत मान क्या है?

SCCGL-10AUG-S3 : 70

- | | |
|---------------------|-------------------|
| (a) cosec A – cot A | (b) sec A – tan A |
| (c) sec 2 A | (d) sec A cosec A |

(25) If $\tan A = 1/2$ and $\tan B = 1/3$, then what is the value of $\tan(2A + B)$?

यदि $\tan A = 1/2$ तथा $\tan B = 1/3$, तो $\tan(2A + B)$ का मान क्या होगा?

SCCGL-10AUG-S3 : 71

- | | | |
|-------|-------|-------|
| (a) 1 | (b) 3 | (c) 5 |
| (d) 9 | | |

(26) What is the simplified value of $[2/(\cot A - \tan A)]$?

$[2/(\cot A - \tan A)]$ का सरलीकृत मान क्या है?

SCCGL-12AUG-S3 : 69

- | | | | |
|---------------------|---------------|----------------|-------------------------|
| (a) $\sin A \cos A$ | (b) $\tan 2A$ | (c) $\tan^2 A$ | (d) $\sin^2 A \cos^2 A$ |
|---------------------|---------------|----------------|-------------------------|

(27)

What is the simplified value of $\sqrt{\frac{\cosec A - 1}{\cosec A + 1}}$?

$\sqrt{\frac{\cosec A - 1}{\cosec A + 1}}$ का सरलीकृत मान क्या है?

SCCGL-12AUG-S3 : 70

- | | |
|--------------|---------------------|
| (a) cosec A | (b) sec A – tan A |
| (c) cosec 2A | (d) tan A – cosec A |

(28) What is the simplified value of $(\sec^4 A - \tan^2 A) - (\tan^4 A + \sec^2 A)$?

$(\sec^4 A - \tan^2 A) - (\tan^4 A + \sec^2 A)$ का सरलीकृत मान क्या है?

SCCGL-12AUG-S3 : 71

- | | | |
|--------|----------|-------|
| (a) -1 | (b) -1/2 | (c) 0 |
| (d) 1 | | |

(29) What is the value of $\tan 45^\circ + 4/\sqrt{3} \sec 60^\circ$?
 $\tan 45^\circ + 4/\sqrt{3} \sec 60^\circ$ का मान क्या है?

SCCGL-17AUG-S1 : 69

- | | |
|-------------------------------|------------------------|
| (a) $(\sqrt{3} + 8)/\sqrt{3}$ | (b) $(\sqrt{3} + 8)/3$ |
| (c) $(\sqrt{3} - 8)/\sqrt{3}$ | (d) $(\sqrt{3} - 8)/3$ |

(30) If $\sin \theta = 20/29$, then what is the value of $\cos \theta$?

यदि $\sin \theta = 20/29$, तो $\cos \theta$ का मान क्या होगा?

SCCGL-17AUG-S1 : 71

- | | | |
|-----------|-----------|-----------|
| (a) 29/21 | (b) 21/29 | (c) 21/20 |
| (d) 20/29 | | |

(31) What is the simplified value of $\cosec 2A + \cot 2A$?

$\cosec 2A + \cot 2A$ का सरलीकृत मान क्या है?

SCCGL-09AUG-S1 : 69

- | | |
|-----------|--------------|
| (a) sec A | (b) sec(A/2) |
| (c) cot A | (d) cot 2 A |

(32) If $A = 30^\circ$, $B = 60^\circ$ and $C = 135^\circ$, then what is the value of $\sin^3 A + \cos^3 B + \tan^3 C - 3\sin A \cos B \tan C$?

दि $A = 30^\circ$, $B = 60^\circ$ तथा $C = 135^\circ$ है, तो $\sin^3 A + \cos^3 B + \tan^3 C - 3\sin A \cos B \tan C$ का मान क्या होगा?

SCCGL-09AUG-S1 : 70

- | | | |
|-------|-------|-------|
| (a) 0 | (b) 1 | (c) 8 |
| (d) 9 | | |

(33) What is the least value of $\tan^2 \theta + \cot^2 \theta + \sin^2 \theta + \cos^2 \theta + \sec^2 \theta + \cosec^2 \theta$?

$\tan^2 \theta + \cot^2 \theta + \sin^2 \theta + \cos^2 \theta + \sec^2 \theta + \cosec^2 \theta$ का न्यूनतम मान क्या है?

SCCGL-09AUG-S1 : 71

- | | | |
|-------|-------|-------|
| (a) 1 | (b) 3 | (c) 5 |
| (d) 7 | | |

(34) What is the simplified value of $(\sec A + \cos A)(\sec A - \cos A)$?

$(\sec A + \cos A)(\sec A - \cos A)$ का सरलीकृत मान क्या है?

SCCGL-09AUG-S2 : 69

- | | |
|-------------------------|---------------------------|
| (a) 2 $\tan^2 A$ | (b) 2 $\sin^2 A$ |
| (c) $\sin^2 A \tan^2 A$ | (d) $\sin^2 A + \tan^2 A$ |

(35)

What is simplified value of $\left(\frac{\cosec A}{\cot A + \tan A}\right)^2$?

$\left(\frac{\cosec A}{\cot A + \tan A}\right)^2$ का सरलीकृत मान क्या है?

SCCGL-09AUG-S2 : 70

- | | |
|-----------------|---------------------|
| (a) $2\cos^2 A$ | (b) $1 - \sin^2 A$ |
| (c) $\sec^2 A$ | (d) $\sec A \tan A$ |

(36)

What is the simplified value of $\frac{\tan A}{1 - \cot A} + \frac{\cot A}{1 - \tan A} - \frac{2}{\sin 2A}$
 $\frac{\tan A}{1 - \cot A} + \frac{\cot A}{1 - \tan A} - \frac{2}{\sin 2A}$ का सरलीकृत मान क्या है?

SCCGL-09AUG-S2 : 71

- | | | |
|--------|-------|-------|
| (a) -1 | (b) 0 | (c) 1 |
| (d) 2 | | |

(37) The measure of the four successive angles of a quadrilateral are in the ratio 7 : 11 : 7 : 11. The quadrilateral is a _____.
एक चतुर्भुज के 4 क्रमागत कोणों का माप 7 : 11 : 7 : 11 के

अनुपात में है। वह चतुर्भुज एक _____ है।

SCCGL-11AUG-S1 : 53

- | | |
|-------------------------------------|---------------------|
| (a) trapezium / समलम्ब | (b) rectangle / आयत |
| (c) parallelogram / समांतर चतुर्भुज | (d) square / वर्ग |

(38) What is the simplified value of $[(\tan^2 \theta - \sin^2 \theta)/\tan^2 \theta \sin^2 \theta]$?

$[(\tan^2 \theta - \sin^2 \theta)/\tan^2 \theta \sin^2 \theta]$ का सरलीकृत मान क्या है?

SCCGL-11AUG-S1 : 69

- | | | |
|--------|-------|-------|
| (a) -1 | (b) 0 | (c) 1 |
| (d) 2 | | |

(39) If $\sec(3x - 20^\circ) = \operatorname{cosec}(3y + 20^\circ)$, then what is the value of $\tan(x + y)$?

यदि $\sec(3x - 20^\circ) = \operatorname{cosec}(3y + 20^\circ)$, तो $\tan(x + y)$ का मान क्या है?

SCCGL-11AUG-S1 : 70

- | | | |
|-----------------|----------------|------------------|
| (a) 1 | (b) $\sqrt{3}$ | (c) $1/\sqrt{3}$ |
| (d) $2\sqrt{3}$ | | |

(40) If $\cot A = n/(n + 1)$ and $\cot B = 1/(2n + 1)$, then what is the value of $\cot(A + B)$?

यदि $\cot A = n/(n + 1)$ तथा $\cot B = 1/(2n + 1)$, तो $\cot(A + B)$ का मान क्या है?

SCCGL-11AUG-S1 : 71

- | | | |
|--------|-------|-------|
| (a) -1 | (b) 0 | (c) 1 |
| (d) 2 | | |

(41) What is the simplified value of $(1 - \sin A \cos A)(\sin A + \cos A)$?

$(1 - \sin A \cos A)(\sin A + \cos A)$ का सरलीकृत मान क्या है?

SCCGL-11AUG-S2 : 69

- | | |
|---------------------------|---------------------------|
| (a) $\sin^2 A - \cos^2 A$ | (b) $\sin^3 A + \cos^3 A$ |
| (c) 0 | (d) $\cos^2 A - \sin^2 A$ |

(42)

What is the simplified of $\sqrt{\frac{1-\sin A}{1+\sin A}}$?

$\sqrt{\frac{1-\sin A}{1+\sin A}}$ का सरलीकृत मान क्या है?

SCCGL-11AUG-S2 : 70

- | | |
|-----------------------|-----------------------|
| (a) $\tan A$ | (b) $\sec A$ |
| (c) $\sec A + \tan A$ | (d) $\sec A - \tan A$ |

(43)

What is the simplified of the value of $\sqrt{\frac{1}{\sin^2 A} + \frac{1}{\cos^2 A}}$?
 $\sqrt{\frac{1}{\sin^2 A} + \frac{1}{\cos^2 A}}$ का सरलीकृत मान क्या है?

SCCGL-11AUG-S2 : 71

- | | |
|---------------------|-----------------------|
| (a) $\sin A \cos A$ | (b) $\tan A + \cot A$ |
| (c) $\sin 2A$ | (d) $\tan A \cot A$ |

(44) What is the value of $\sin(-\pi/3) + \cos(-\pi/6)$?
 $\sin(-\pi/3) + \cos(-\pi/6)$ का मान क्या है?

SCCGL-12AUG-S1 : 69

- | | | |
|-------|-------|-------|
| (a) 0 | (b) 1 | (c) 2 |
| (d) 3 | | |

(45) If θ is acute angle and $\tan \theta - \cot \theta = 0$, then what is the value of $\tan^{26} \theta + \cot^{100} \theta$?

यदि θ एक न्यूनकोण है तथा $\tan \theta - \cot \theta = 0$, तो $\tan^{26} \theta + \cot^{100} \theta$ का मान क्या होगा?

SCCGL-12AUG-S1 : 70

- | | | |
|--------|-------|-------|
| (a) -2 | (b) 0 | (c) 1 |
| (d) 2 | | |

(46) If $\sin 30 \sec 2\theta = 1$, then what is the value of $[\tan^2(50/2) - 1]$?

SCCGL-12AUG-S1 : 71

- | | | |
|-------|-------|-------|
| (a) 0 | (b) 1 | (c) 2 |
| (d) 3 | | |

(47) What is the simplified value of $(\operatorname{cosec} A + \sin A)(\operatorname{cosec} A - \sin A)$?

$(\operatorname{cosec} A + \sin A)(\operatorname{cosec} A - \sin A)$ का सरलीकृत मान क्या है?

SCCGL-12AUG-S2 : 69

- | | |
|---------------------------|-----------------------|
| (a) $\cos^2 A + \cot^2 A$ | (b) $2 \cos^2 A$ |
| (c) $2 \cot^2 A$ | (d) $2 \cos A \cot A$ |

(48)

What is the simplified value of $\sqrt{\frac{\sec A}{\sec A - 1} + \frac{\sec A}{\sec A + 1}}$?

$\sqrt{\frac{\sec A}{\sec A - 1} + \frac{\sec A}{\sec A + 1}}$ का सरलीकृत मान क्या है?

SCCGL-12AUG-S2 : 70

- | | |
|------------------------------|---------------------------------------|
| (a) $\operatorname{cosec} A$ | (b) $\sqrt{2} \operatorname{cosec} A$ |
| (c) $2 \sec^2 A$ | (d) $\sec A$ |

(49)

What is the simplified value of $\left[\frac{\cos A}{(1 - \tan A)} + \frac{\sin A}{(1 - \cot A)} \right]^2$?

$\left[\frac{\cos A}{(1 - \tan A)} + \frac{\sin A}{(1 - \cot A)} \right]^2$ का सरलीकृत मान क्या है?

SCCGL-12AUG-S2 : 71

- (a) $\sin A + \cos A$ (b) $1 + \sin 2A$
 (c) $1 + \cos 2A$ (d) $\tan A + \cot A$

(50)

What is the simplified value of $\left(\frac{2}{\cot^{\frac{A}{2}} + \tan^{\frac{A}{2}}} \right)$?

$\left(\frac{2}{\cot^{\frac{A}{2}} + \tan^{\frac{A}{2}}} \right)$ का सरलीकृत मान क्या है ?

SCCGL-09AUG-S3 : 69

- (a) $\sin A$ (b) $\cos A/2$
 (c) $\cos 2A$ (d) $2 \sin A/2$

(51)

What is the simplified value of $\left(\frac{1}{\sec A + \tan A} \right)$?

$\left(\frac{1}{\sec A + \tan A} \right)^2$ का सरलीकृत मान क्या है ?

SCCGL-09AUG-S3 : 70

- (a) $\sec A + \tan A$ (b) $\sin A \cos A$
 (c) $(1 - \sin A)/(1 + \sin A)$ (d) $(1 - \cos A)/(1 + \cos A)$

(52) What is the simplified value of $(\operatorname{cosec}^4 A - \cot^2 A) - (\cot^4 A + \operatorname{cosec}^2 A)$?

SCCGL-09AUG-S3 : 71

- (a) 0 (b) 5 (c) 6
 (d) 9

(53) A boat is sailing towards a lighthouse of height $20\sqrt{3}$ m at a certain speed. The angle of elevation of the top of the lighthouse changes from 30° to 60° in 10 seconds. What is the time taken (in seconds) by the boat to reach the lighthouse from its initial position? एक नाव एक निश्चित गति से $20\sqrt{3}$ मिटर की चाल से ऊँचाई वाले एक लाईट हाउस की तरु जा रही है। लाईट हाउस के ऊपरी हिस्से से बना अवनमन कोण 10 सेकण्ड में 30° से 60° में परिवर्तित हो जाता है। अपने प्रारंभिक स्थान से लाईट हाउस तक पहुँचने में नाव द्वारा लिया गया समय (सेकण्ड में) कितना है?

SCCGL-16AUG-S1 : 69

- (a) 10 (b) 15 (c) 20
 (d) 60

(54) What is the value of $[\sec \theta/(\sec \theta - 1)] + [\sec \theta/(\sec \theta + 1)]$?

$[\sec \theta/(\sec \theta - 1)] + [\sec \theta/(\sec \theta + 1)]$ का मान क्या है?

SCCGL-16AUG-S1 : 70

- (a) $2 \sin^2 \theta$ (b) $2(1 + \tan^2 \theta)$
 (c) $2 \operatorname{cosec}^2 \theta$ (d) $\sin^2 \theta$

(55) What is the simplified value of $\sec^6 A - \tan^6 A - 3 \sec^2 A \tan^2 A$?

$\sec^6 A - \tan^6 A - 3 \sec^2 A \tan^2 A$ का सरलीकृत मान क्या है ?

SCCGL-16AUG-S2 : 69

- (a) -1 (b) 0 (c) 1 (d) $\sec A$
 $\tan A$

(56) What is the simplified value of $(\operatorname{cosec} A - \sin A)(\sec A - \cos A)(\tan A + \cot A)$?

$(\operatorname{cosec} A - \sin A)(\sec A - \cos A)(\tan A + \cot A)$ का सरलीकृत मान क्या है ?

SCCGL-16AUG-S2 : 70

- (a) -1 (b) 0 (c) 1
 (d) 2

(57) What is the simplified value of $(\cos^4 A - \sin^4 A)$?

$(\cos^4 A - \sin^4 A)$ का सरलीकृत मान क्या है ?

SCCGL-16AUG-S2 : 71

- (a) 0 (b) $2 \cos 2A$ (c) $\cos 2A$
 (d) 1

(58) If $\operatorname{cosec}^2 \theta = 625/576$, then what is the value of $[(\sin \theta - \cos \theta)/(\sin \theta + \cos \theta)]$?

यदि $\operatorname{cosec}^2 \theta = 625/576$, तो $[(\sin \theta - \cos \theta)/(\sin \theta + \cos \theta)]$ का मान क्या होगा?

SCCGL-16AUG-S3 : 69

- (a) 1 (b) $31/17$ (c) $17/31$
 (d) $14/25$

(59)

What is the value of $\frac{3}{2} \left(\frac{\cos 39}{\sin 51} \right) - \sqrt{\sin^2 39 + \sin^2 51}$?

$\frac{3}{2} \left(\frac{\cos 39}{\sin 51} \right) - \sqrt{\sin^2 39 + \sin^2 51}$ का मान क्या है ?

SCCGL-16AUG-S3 : 70

- (a) $1/2$ (b) $5/2$ (c) 0 (d) Both $1/2$ and $5/2$

(60) If $\cot A = [\sin B/(1 - \cos B)]$, then what is the value of $\cot 2A$?

यदि $\cot A = [\sin B/(1 - \cos B)]$, तो $\cot 2A$ का मान क्या होगा?

SCCGL-16AUG-S3 : 71

- (a) $\operatorname{cosec} B$ (b) $\cot 2B$ (c) $\cot B$
 (d) $\tan B$

(61) What is the value of $\tan 60^\circ + \operatorname{cosec} 60^\circ$?

$\tan 60^\circ + \operatorname{cosec} 60^\circ$ का मान क्या है?

SCCGL-17AUG-S2 : 69

- (a) $5/3$ (b) $2/\sqrt{3}$ (c) $5/\sqrt{3}$
 (d) $2/3$

(62) If $\operatorname{cosec} \theta = 17/8$, then what is the value of $\cos \theta$?

यदि $\operatorname{cosec} \theta = 17/8$ है, तो $\cos \theta$ का मान क्या है?

(c) $(\sqrt{3} + 2)/\sqrt{2}$ (d) $(\sqrt{3} + \sqrt{2})/2$

(78) $\triangle LMN$ is right angled at M. If $m \angle N = 45^\circ$. What is the length (in cm) of MN, if $NL = 6\sqrt{2}$ cm?
 $\triangle LMN$, M पर समकोण है। यदि $m \angle N = 45^\circ$ है, तो MN की लंबाई (सेमी. में) क्या है, यदि $NL = 6\sqrt{2}$ सेमी. है?

SCCGL-19AUG-S2 : 70

- (a) 3 (b) 4 (c) 2
(d) 6

(79) If $\cos \theta = 35/37$, then what is the value of $\operatorname{cosec} \theta$?
यदि $\cos \theta = 35/37$ है, तो $\operatorname{cosec} \theta$ का मान क्या है?

SCCGL-19AUG-S2 : 71

- (a) $37/12$ (b) $33/12$ (c) $35/12$
(d) $12/35$

(80) What is the value of $(1/2) \sec 30^\circ + \sqrt{2} \tan 60^\circ$?
 $(1/2) \sec 30^\circ + \sqrt{2} \tan 60^\circ$ का मान क्या है?

SCCGL-19AUG-S3 : 69

- (a) $(1 + 3\sqrt{2})/\sqrt{3}$ (b) $(\sqrt{3} + 2)/\sqrt{3}$
(c) $(\sqrt{3} + 2)$ (d) $(\sqrt{3} + 2)/2$

(81) $\triangle DEF$ is right angled at E. If $m \angle D = 45^\circ$, then what is the value of $\operatorname{cosec} F \times \cot D$?
 $\triangle DEF$, E पर समकोण है। यदि $m \angle D = 45^\circ$ है, तो $\operatorname{cosec} F \times \cot D$ का मान क्या है?

SCCGL-19AUG-S3 : 70

- (a) $1/\sqrt{2}$ (b) 2 (c) $1/2$
(d) $\sqrt{2}$

(82) If $\sec \theta = 25/24$, then what is the value of $\sin \theta$?
यदि $\sec \theta = 25/24$, तो $\sin \theta$ का मान क्या है?

SCCGL-19AUG-S3 : 71

- (a) $24/25$ (b) $7/25$ (c) $24/7$
(d) $25/7$

(83) What is the value of $\sin 30^\circ + \cos 30^\circ$?
 $\sin 30^\circ + \cos 30^\circ$ का मान क्या है?

SCCGL-20AUG-S1 : 69

- (a) $\sqrt{6} + 1/\sqrt{3}$ (b) $\sqrt{3} + 2/\sqrt{3}$
(c) $1 + \sqrt{3}/2$ (d) $5/\sqrt{3}$

(84) $\triangle ABC$ is right angled at B. If $m \angle A = 30^\circ$, then $\sec C = ?$
 $\triangle ABC$ ये B पर समकोण है। अगर $m \angle A = 30^\circ$ है, तो $\sec C = ?$

SCCGL-20AUG-S1 : 70

- (a) $1/2$ (b) $1/\sqrt{2}$ (c) 2
(d) $1/\sqrt{3}$

(85) If $\sin \theta = 12/13$, then what is the value of $\cot \theta$?
यदि $\sin \theta = 12/13$, तो $\cot \theta$ का मान क्या है?

SCCGL-20AUG-S1 : 71

- (a) $13/12$ (b) $5/13$ (c) $5/12$
(d) $13/5$

(86) What is the value of $\tan 45^\circ - 1/\sqrt{3} \sec 60^\circ$?
 $\tan 45^\circ - 1/\sqrt{3} \sec 60^\circ$ का मान क्या है?

SCCGL-20AUG-S2 : 69

- (a) $1 - 2\sqrt{3}/2$ (b) $\sqrt{2} - \sqrt{3}/\sqrt{6}$
(c) $3 - 2\sqrt{3}/3$ (d) $1 - 2\sqrt{2}/2$

(87) $\triangle DEF$ is right angled at E. If $m \angle D = 30^\circ$, what is the length of DE (in cm), if EF = $6\sqrt{3}$ cm?
 $\triangle DEF$, E पर समकोण है। यदि $m \angle D = 30^\circ$ है, तो DE की

लंबाई (सेमी.) क्या है, यदि $EF = 6\sqrt{3}$ सेमी. है ?

SCCGL-20AUG-S2 : 70

- (a) 18 (b) $12\sqrt{3}$ (c) $18\sqrt{3}$
(d) 12

(88) If $\sin \theta = 20/29$, then what is the value of $\sec \sin \theta$?
यदि $\sin \theta = 20/29$, तो $\sec \sin \theta$ का मान क्या है ?

SCCGL-20AUG-S2 : 71

- (a) $29/21$ (b) $29/20$ (c) $21/20$
(d) $21/29$

(89) What is the value of $2 \sec 45^\circ + \tan 30^\circ$?
 $2 \sec 45^\circ + \tan 30^\circ$ का मान क्या है?

SCCGL-21AUG-S1 : 69

- (a) $2\sqrt{6} + 1/\sqrt{3}$ (b) $\sqrt{3}$
(c) $2\sqrt{2} + 3/\sqrt{6}$ (d) $9 + 2\sqrt{3}/9$

(90) $\triangle ABC$ is right angled at B. If $m \angle A = 60^\circ$, then what is the value of $\cot C$?
 $\triangle ABC$, B पर समकोण है। यदि $m \angle A = 60^\circ$ है तो $\cot C$ का

मान क्या होगा?

SCCGL-21AUG-S1 : 70

- (a) $\sqrt{2}$ (b) $1/\sqrt{3}$ (c) $\sqrt{3}$
(d) $2/\sqrt{3}$

(91) If $\operatorname{cosec} \theta = 25/7$, then what is the value of $\cos \theta$?
यदि $\operatorname{cosec} \theta = 25/7$ तो $\cos \theta$ का मान क्या होगा?

SCCGL-21AUG-S1 : 71

- (a) $25/24$ (b) $7/24$ (c) $24/25$
(d) $7/25$

(92) What is the value of $\cot 60^\circ - \sec 45^\circ$?
 $\cot 60^\circ - \sec 45^\circ$ का मान क्या है?

SCCGL-21AUG-S2 : 69

- (a) $\sqrt{2} - \sqrt{1}/\sqrt{6}$ (b) $\sqrt{3} - 3\sqrt{2}/3$
 (c) $1 - 2\sqrt{2}/2$ (d) $1 - \sqrt{1}/2$

(93) ΔABC is right angled at B. If $m\angle A = 30^\circ$, what is the length of AB (in cm), if AC = 10 cm?

ΔABC , B पर समकोण है। यदि $m\angle A = 30^\circ$ है, तो AB की लंबाई (से.मी. में) क्या है, यदि AC = 10 से.मी. है?

SCCGL-21AUG-S2 : 70

- (a) 5 (b) $5\sqrt{3}$ (c) $10\sqrt{3}$
 (d) 10

(94) If $\text{Cot } \theta = 24/7$, then $\text{Sin } \theta = ?$

यदि $\text{Cot } \theta = 24/7$ तो $\text{Sin } \theta = ?$

SCCGL-21AUG-S2 : 71

- (a) $24/25$ (b) $8/25$ (c) $7/25$
 (d) $9/25$

(95) What is the value of $\text{Sec } 30^\circ + \text{Tan } 60^\circ$?

$\text{Sec } 30^\circ + \text{Tan } 60^\circ$ का मान क्या है?

SCCGL-22AUG-S1 : 69

- (a) $5/\sqrt{3}$ (b) $\sqrt{6} + 1/\sqrt{3}$
 (c) $\sqrt{3} + 2/\sqrt{3}$ (d) $1 + \sqrt{3}/2$

(96) ΔPQR is right angled at Q. If $\angle R = 30^\circ$, then what is the value of $\text{Cot } P$?

ΔPQR ये Q पर समकोण है। यदि $\angle R = 30^\circ$ है, तो $\text{Cot } P$ का मान क्या है?

SCCGL-22AUG-S1 : 70

- (a) $1/2$ (b) $1/\sqrt{2}$ (c) $1/\sqrt{3}$
 (d) 2

(97) If $\text{Sec } \theta = 5/3$, then what is the value of $\text{Cosec } \theta$?

यदि $\text{Sec } \theta = 5/3$, तो $\text{Cosec } \theta$ का मान क्या है?

SCCGL-22AUG-S1 : 71

- (a) 0.8 (b) 1.25 (c) 4/3
 (d) 3/4

(98) What is the value of $\text{Sin } 30^\circ - \text{Cosec } 45^\circ$?

$\text{Sin } 30^\circ - \text{Cosec } 45^\circ$ का मान क्या है?

SCCGL-22AUG-S3 : 69

- (a) $(2\sqrt{6} - 1)/\sqrt{3}$ (b) $(1 - 2\sqrt{3})/2$
 (c) $(\sqrt{2} - \sqrt{3})/\sqrt{6}$ (d) $(1 - 2\sqrt{2})/2$

(99) ΔLMN is right angled at M. If $m\angle N = 45^\circ$, what is the length of MN (in cm), if $NL = 9\sqrt{2}$ cm?

ΔLMN , M पर समकोण है। यदि $m\angle N = 45^\circ$ है, तो MN की लंबाई (से.मी. में) क्या है, यदि $NL = 9\sqrt{2}$ से.मी. है?

SCCGL-22AUG-S3 : 70

- (a) $9\sqrt{2}$ (b) $9/\sqrt{2}$ (c) 18
 (d) 9

(100) If $\text{Cos } \theta = 35/37$, then what is the value of $\text{Cot } \theta$?

यदि $\text{Cos } \theta = 35/37$, तो $\text{Cot } \theta$ का मान क्या है?

SCCGL-22AUG-S3 : 71

- (a) $12/35$ (b) $35/12$ (c) $37/12$
 (d) $12/37$

(101) $\text{Tan } 45^\circ + \text{Cosec } 60^\circ =$

$\text{Tan } 45^\circ + \text{Cosec } 60^\circ =$

SCCGL-23AUG-S1 : 69

- (a) $(1 + 2\sqrt{2})/2$ (b) $(\sqrt{3} + 2)/\sqrt{6}$
 (c) $(5/\sqrt{3})$ (d) $(3 + 2\sqrt{3})/3$

(102) ΔXYZ is right angled at Y. If $m\angle Z = 60^\circ$, then $\text{Cosec } X =$

ΔXYZ , Y पर समकोण है। यदि $m\angle Z = 60^\circ$ है, तो $\text{Cosec } X =$

SCCGL-23AUG-S1 : 70

- (a) 2 (b) $1/\sqrt{2}$ (c) $1/\sqrt{2}$
 (d) $1/\sqrt{3}$

(103) If $\text{Cosec } \theta = 17/8$, then $\text{Cot } \theta = ?$

यदि $\text{Cosec } \theta = 17/8$, तो $\text{Cot } \theta = ?$

SCCGL-23AUG-S1 : 71

- (a) $17/8$ (b) $15/8$ (c) $8/15$
 (d) $17/15$

(104) What is the value of $\text{Sin } 30^\circ + 2 \text{ Cos } 30^\circ$?

$\text{Sin } 30^\circ + 2 \text{ Cos } 30^\circ$ का मान क्या है?

SCCGL-23AUG-S2 : 69

- (a) $(2\sqrt{2} + 3)/\sqrt{6}$ (b) $(9 + 2\sqrt{3})/9$
 (c) $(1 + 2\sqrt{3})/2$ (d) $(2\sqrt{6} + 1)/\sqrt{3}$

(105) ΔXYZ is right angled at Y. If $\angle Z = 60^\circ$, what is the length of YZ (in cm), if $ZX = 3\sqrt{3}$ cm?

ΔXYZ , Y पर समकोण है। यदि $\angle Z = 60^\circ$ है, तो YZ की लंबाई (से.मी. में) क्या है, यदि $ZX = 3\sqrt{3}$ से.मी. है?

SCCGL-23AUG-S2 : 70

- (a) $3\sqrt{3}/2$ (b) $3\sqrt{3}$ (c) 9
 (d) 6

(106) If $\text{Sec } \theta = 13/12$, then $\text{Cot } \theta = ?$

यदि $\text{Sec } \theta = 13/12$, तो $\text{Cot } \theta = ?$

SCCGL-23AUG-S2 : 71

- (a) $12/5$ (b) $13/5$ (c) $5/13$
 (d) $5/12$

(107) What is the value of $\text{Cot } 45^\circ + 1/3 \text{ Cosec } 60^\circ$?

$\text{Cot } 45^\circ + 1/3 \text{ Cosec } 60^\circ$ का मान क्या है?

SCCGL-23AUG-S3 : 69

- (a) $\sqrt{3} + 2$ (b) $(9 + 2\sqrt{3})/9$
 (c) $\sqrt{3}$ (d) $(2\sqrt{2} + 3)/\sqrt{6}$

(108) Δ DEF is right angled at E. If $m\angle F = 45^\circ$, then what is the value of $\sin F \times \tan F$?

Δ DEF, E पर समकोण है। यदि $m\angle F = 45^\circ$ है, तो $\sin F \times \tan F$ का मान क्या होगा?

SCCGL-23AUG-S3 : 70

- (a) $\sqrt{2}$ (b) $1/\sqrt{3}$ (c) $1/\sqrt{2}$
 (d) $2/\sqrt{3}$

(109) If $\cot \theta = 21/20$, then what is the value of $\sec \theta$?
 यदि $\cot \theta = 21/20$, तो $\sec \theta$ का मान क्या होगा?

SCCGL-23AUG-S3 : 71

- (a) $29/21$ (b) $21/29$ (c) $29/20$
 (d) $20/29$

(110)

What is the simplified value of $\frac{\cot A + \tan B}{\cot B + \tan A}$?
 $\frac{\cot A + \tan B}{\cot B + \tan A}$ का सरलीकृत मान क्या है ?

SCCGL-05AUG-S1 : 69

- (a) $\tan B \cot A$ (b) $\tan A \cot B$
 (c) $\tan A \tan B$ (d) $\cot A \cot B$

(111)

what is the simplified value of $\left(\frac{1}{\cosec A + \cot A}\right)^2$?
 $\left(\frac{1}{\cosec A + \cot A}\right)^2$ का सरलीकृत मान क्या है

SCCGL-05AUG-S1 : 70

- (a) $\sec A + \tan A$ (b) $(1 - \cos A)/(1 + \cos A)$
 (c) $(1 - \cosec A)/(1 + \cosec A)$ (d) $\sin A$

(112) If $\cos^2 \theta - \sin \theta = 1/4$, then what is the value of $\sin \theta$?
 यदि $\cos^2 \theta - \sin \theta = 1/4$, तो $\sin \theta$ का मान क्या होगा?

SCCGL-05AUG-S1 : 71

- (a) -1 (b) $1/2$ (c) 1
 (d) $3/2$

(113) What is the value of $\cot 45^\circ - (1/\sqrt{3})\cosec 60^\circ$?
 $\cot 45^\circ - (1/\sqrt{3})\cosec 60^\circ$ का मान क्या है ?

SCCGL-06AUG-S1 : 69

- (a) $1/\sqrt{3}$ (b) $1/2$ (c) $1/\sqrt{2}$
 (d) $1/3$

(114) Δ DEF is right angled at E. If $m\angle F = 45^\circ$, then what is the value of $2 \sin F \times \cot F$?

Δ DEF E पर समकोण है। यदि $m\angle F = 45^\circ$ है, तो $2 \sin F \times \cot F$ का मान क्या है?

SCCGL-06AUG-S1 : 70

- (a) $\sqrt{2}$ (b) 2 (c) $1/\sqrt{2}$
 (d) $1/2$

(115) If $\cot \theta = 21/20$, then what is the value of $\cosec \theta$?
 यदि $\cot \theta = 21/20$ है, तो $\cosec \theta$ का मान क्या है?

SCCGL-06AUG-S1 : 71

- (a) $21/29$ (b) $29/21$ (c) $20/29$
 (d) $29/20$

(116) What is the value of $\tan 6^\circ \tan 36^\circ \tan 84^\circ \tan 54^\circ \tan 45^\circ$?
 $\tan 6^\circ \tan 36^\circ \tan 84^\circ \tan 54^\circ \tan 45^\circ$ का मान क्या है?

SCCGL-06AUG-S1 : 74

- (a) $1/2$ (b) $1/\sqrt{2}$ (c) 1
 (d) $1/3$

(117) What is the value of $1/\sqrt{2} \cot 30^\circ + 1/\sqrt{3} \cosec 60^\circ$?
 $1/\sqrt{2} \cot 30^\circ + 1/\sqrt{3} \cosec 60^\circ$ का मान क्या है?

SCCGL-06AUG-S3 : 69

- (a) $(3\sqrt{3} + 2\sqrt{2})/3\sqrt{2}$
 $2\sqrt{2}/3\sqrt{2}$
 (c) $(3\sqrt{3} + 2\sqrt{2})/\sqrt{2}$ (d) $(3\sqrt{3} - 2\sqrt{2})/\sqrt{2}$

(118) Δ ABC is right angled at B. If $m\angle A = 60^\circ$, then what is the value of $2 \sec C \times 1/2 \sin A$?
 Δ ABC B पर समकोण है। यदि $m\angle A = 60^\circ$ है, तो $2 \sec C \times 1/2 \sin A$ का मान क्या होगा?

SCCGL-06AUG-S3 : 70

- (a) $1/2$ (b) $1/3$ (c) 1
 (d) $1/\sqrt{2}$

(119) If $\tan \theta = 7/24$, then what is the value of $\cosec \theta$?
 यदि $\tan \theta = 7/24$ है, तो $\cosec \theta$ का मान क्या है?

SCCGL-06AUG-S3 : 71

- (a) $25/24$ (b) $25/7$ (c) $24/7$
 (d) $24/25$

(120)

What is the simplified value of $\frac{\sin 2A}{1+\cos 2A}$?
 $\frac{\sin 2A}{1+\cos 2A}$ का सरलीकृत मान क्या है ?

SCCGL-08AUG-S1 : 69

- (a) $\tan A$ (b) $\cot A$ (c) $\sin A$
 (d) $\cos A$

(121)

What is the simplified value of $\left(\frac{\sec A}{\cot A + \tan A}\right)^2$?
 $\left(\frac{\sec A}{\cot A + \tan A}\right)^2$ का सरलीकृत मान क्या है?

SCCGL-08AUG-S1 : 70

- (a) $1 - \cos^2 A$ (b) $2\sin^2 A$ (c) $\sec^2 A$ (d) $\operatorname{cosec}^2 A$

(122) What is the simplified value of $1 + \tan A \tan(A/2)$?
 $1 + \tan A \tan(A/2)$ का सरलीकृत मान क्या है?

SCCGL-08AUG-S1 : 71

- (a) $\sin A/2$ (b) $\cos A$ (c) $\sec A$ (d) $\sin A$

(123) What is the value of $\operatorname{Cot} 45^\circ + \operatorname{Cosec} 60^\circ$?
 $\operatorname{Cot} 45^\circ + \operatorname{Cosec} 60^\circ$ का मान क्या है?

SCCGL-20AUG-S3 : 69

- (a) $(\sqrt{6} + 1)/\sqrt{3}$ (b) $(1 + \sqrt{3})/2$
(c) $5/\sqrt{3}$ (d) $(\sqrt{3} + 2)/\sqrt{3}$

(124) ΔLMN is right angled at M. If $m\angle N = 60^\circ$, then
 $\operatorname{Tan} L = \dots$.

ΔLMN ये M पर समकोण है। यदि $m\angle N = 60^\circ$ है, तो $\operatorname{Tan} L = \dots$

SCCGL-20AUG-S3 : 70

- (a) $1/2$ (b) $1/\sqrt{3}$ (c) $1/\sqrt{2}$
(d) 2

(125) If $\operatorname{Tan} \theta = 4/3$, then what is the value of $\operatorname{Sin} \theta$?

यदि $\operatorname{Tan} \theta = 4/3$, तो $\operatorname{Sin} \theta$ का मान क्या है?

SCCGL-20AUG-S3 : 71

- (a) 1.25 (b) 0.8 (c) 4/3
(d) $3/4$

1	A	2	D	3	C	4	B	5	C
6	B	7	D	8	A	9	A	10	A
11	A	12	B	13	C	14	C	15	D
16	D	17	A	18	D	19	D	20	B
21	B	22	D	23	D	24	A	25	B
26	B	27	B	28	C	29	A	30	B
31	C	32	A	33	D	34	D	35	B
36	C	37	C	38	C	39	C	40	A
41	B	42	D	43	B	44	A	45	D
46	C	47	A	48	B	49	B	50	A

51	C	52	A	53	B	54	C	55	C
56	C	57	C	58	C	59	D	60	C
61	C	62	B	63	D	64	D	65	C
66	A	67	D	68	B	69	B	70	B
71	C	72	B	73	A	74	B	75	C
76	A	77	D	78	D	79	A	80	A
81	D	82	B	83	C	84	C	85	C
86	C	87	A	88	A	89	A	90	C
91	C	92	B	93	B	94	C	95	A
96	C	97	B	98	D	99	D	100	B
101	D	102	A	103	B	104	C	105	A
106	A	107	B	108	C	109	A	110	A
111	B	112	B	113	D	114	A	115	D
116	C	117	A	118	C	119	B	120	A
121	A	122	C	123	D	124	B	125	B

Solution

(1)

$$\sec 45^\circ + \operatorname{Tan} 30^\circ \\ = \sqrt{2} + \frac{1}{\sqrt{3}} = \frac{\sqrt{6} + 1}{\sqrt{3}}$$

(2)

$$\cos \theta = \frac{5}{13} = \frac{b}{h} \\ P = \sqrt{(13)^2 - (5)^2} \\ = \sqrt{144} = 12 \\ \operatorname{Cosec} \theta = \frac{h}{p} = \frac{13}{12}$$

(3)

$$\sin^2(90^\circ - \theta) - \{\sin(90^\circ - \theta) \cdot \sin \theta / \tan \theta\} \\ = \cos^2 \theta - (\cos \theta \cdot \sin \theta \cdot \cos \theta / \sin \theta) \\ = \cos^2 \theta - \cos^2 \theta \\ = 0$$

(4)

$$\left(\frac{\cos^2 \theta}{1+\sin \theta} - \frac{\sin^2 \theta}{1+\cos \theta} \right)^2 = (1 - \sin \theta)(1 - \cos \theta)$$

After solving $[\cos \theta - \sin \theta]^2$
 $= 1 - 2\sin \theta \cos \theta = 1 - \sin^2 \theta$

(5)

$$5 \sec \theta - 3 \tan \theta = 5$$

$$25 \sec^2 \theta + 9 \tan^2 \theta - 30 \sec \theta \tan \theta = 25$$

-- (i)

$$\sec 5 \tan \theta = 3 \sec \theta = x$$

$$= 25 \tan^2 \theta + 9 \sec^2 \theta - 30 \sec \theta \tan \theta = x^2$$

-- (ii)

Substracting (i) and (ii)

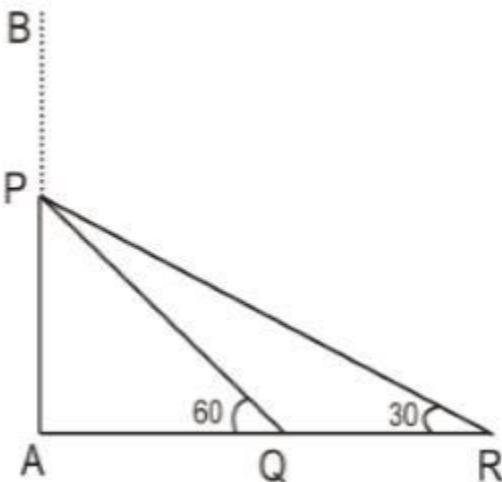
$$25(\sec^2 \theta - \tan^2 \theta) + 9(\tan^2 \theta - \sec^2 \theta) = 25 - x^2$$

$$= 25 - 9 = 25 - x^2$$

$$x^2 = 9, x = 3 \therefore 5 \tan \theta - 3 \sec \theta = 3$$

(6)

(7)



The height of tower = PB + PA

in triangle PAR

$$\tan 30^\circ = PA / (AQ + 180)$$

$$1/\sqrt{3} =$$

$$PA / (AQ + 180) \dots (1)$$

in triangle PAQ

$$\tan 60^\circ = PA / AQ$$

$$\sqrt{3} =$$

$$PA / AQ$$

$$AQ = PA / \sqrt{3} \dots (2)$$

putting this value in equation

$$(1)$$

$$1/\sqrt{3}(AQ + 180) = PA$$

$$1/\sqrt{3}(PA/\sqrt{3} + 180) = PA$$

$$PA/3 + 1800/\sqrt{3} = PA$$

$$PA = 45\sqrt{3}$$

in triangle PAQ,
 $\sin 60^\circ = PA / PQ$
 $\sqrt{3}/3 = 45\sqrt{3} / PQ$

$$PQ = 90$$

$$PB = PQ = 90$$

$$\text{therefore, } AB = 90 + 45\sqrt{3} = 45(2 + \sqrt{3})$$

$$(8)$$

$$\sin x + \sin 5x = \sin 3x$$

$$2\sin((6x)/2)\cos(4x/2) = \sin 3x$$

$$2\sin 3x \cos 2x = \sin 3x$$

$$\cos 2x = 1/2$$

$$\cos 2x = \cos 60^\circ$$

$$2x = 60^\circ$$

$$x = 30^\circ$$

(9)

$$\begin{aligned}
 & (\cos A + \sin A)(\cot A + \tan A) = \\
 &= (\cos A + \sin A) \left(\frac{\cos A}{\sin A} + \frac{\sin A}{\cos A} \right) \\
 &= (\cos A + \sin A) \left(\frac{\cos^2 A + \sin^2 A}{\sin A \cos A} \right) \\
 &= \frac{\cos A + \sin A}{\sin A \cos A} = \cosec A + \sec A
 \end{aligned}$$

(10)

$$\begin{aligned}
 & \sqrt{\frac{\cosec A}{\cosec A - 1} + \frac{\cosec A}{\cosec A + 1}} \\
 &= \sqrt{\frac{(\cosec A + 1) \cosec A + (\cosec A - 1) \cosec}{(\cosec A - 1)(\cosec A + 1)}} \\
 &= \sqrt{2} \frac{\cosec A}{\cot A} = \sqrt{2} \sec A
 \end{aligned}$$

(11)

$$\begin{aligned}
 2 \cos \theta &= 2 - \sin \theta \\
 2 \cos \theta - 2 &= -\sin \theta \\
 (2 \cos \theta - 2)^2 &= (-\sin \theta)^2 \\
 4 \cos^2 \theta + 4 - 8 \cos \theta &= \sin^2 \theta \\
 4 \cos^2 \theta + 4 + \cos^2 \theta - 1 - 8 \cos \theta &= 0 \\
 5 \cos^2 \theta - 8 \cos \theta + 3 &= 0 \\
 5 \cos \theta (\cos \theta - 1) - 3 (\cos \theta - 1) &= 0 \\
 \cos \theta &= 1, 3/5
 \end{aligned}$$

(12)

$$\begin{aligned}
 \text{Cot } 60^\circ - \text{cot } 45^\circ &= 1/\text{sq. root } 3 - 1/\text{sq. root } 2 \\
 \text{sq. root } 2 - 3/6 &
 \end{aligned}$$

(13)

$$\begin{aligned}
 \tan \theta &= 9/40 \\
 \text{W.K.T} \\
 \text{Sq. sec} \theta &= 1 + \text{sq. tan} \theta = 1 + (81/1600) \\
 \Rightarrow \text{sec} \theta &= 41/40
 \end{aligned}$$

(14)

$$\frac{1}{1 - \tan \theta} - \frac{1}{1 + \tan \theta} = \frac{1 + \tan \theta - 1 + \tan \theta}{1 - \tan^2 \theta} = \frac{2 \tan \theta}{1 - \tan^2 \theta} =$$

(15)

$$\tan \theta + \frac{1}{\tan \theta} = x$$

Then

$$\begin{aligned}
 \tan^2 \theta + \frac{1}{\tan^2 \theta} &= x^2 - 2 \\
 \tan^4 \theta + \frac{1}{\tan^4 \theta} &= (x^2 - 2)^2 - 2 \\
 &= x^4 + 4 - 4x^2 - 2 \\
 &= x^4 - 4x^2 + 2 \\
 &= x^2(x^2 - 4) + 2
 \end{aligned}$$

(16)

$$\text{Put } \tan \theta = 1, \therefore \cot \theta = 1$$

$$\text{Then, } \theta = 45^\circ$$

$$\begin{aligned}
 \sec \theta \cdot \cosec \theta &= \sec 45^\circ \cdot \cosec 45^\circ \\
 &= \sqrt{2} \cdot \sqrt{2} = 2 \\
 &= 2^2 = 4
 \end{aligned}$$

(17)

$$\begin{aligned}
 \tan \frac{\theta}{2} + \cot \frac{\theta}{2} \\
 \frac{\sin \frac{\theta}{2}}{\cos \frac{\theta}{2}} + \frac{\cos \frac{\theta}{2}}{\sin \frac{\theta}{2}}
 \end{aligned}$$

After solving

$$= \frac{2}{\sin \theta} = 2 \cosec \theta$$

(18)

$$\begin{aligned}
 & \frac{\sec^3 x - \tan^3 x}{\sec x - \tan x} - 2 \tan^2 x - \sec x \cdot \tan x \\
 \text{After solving} \\
 &= \sec^2 x + \tan^2 x + \sec x \cdot \tan x - 2 \tan^2 x - \sec x \cdot \tan x \\
 &= \sec^2 x - \tan^2 x = 1
 \end{aligned}$$

(19)

$$\begin{aligned}
 \sin^2 \theta + \cos^2 \theta &= 1 \quad (\text{Squaring both sides}) \\
 \Rightarrow \sin^4 \theta + \cos^4 \theta &= 1 - 2 \sin^2 \theta \cos^2 \theta \quad (\text{again squaring}) \\
 \Rightarrow \sin^8 \theta + \cos^8 \theta + 2 \sin^4 \theta \cdot \cos^4 \theta &= 1 + 4 \sin^4 \theta \cos^4 \theta - 4 \sin^2 \theta \cos^2 \theta \\
 \Rightarrow \sin^8 \theta + \cos^8 \theta - 1 &= 2 \sin^4 \theta \cos^4 \theta - 4 \sin^2 \theta \cos^2 \theta \\
 0 &= 2 \sin^4 \theta \cos^4 \theta - 4 \sin^2 \theta \cos^2 \theta \\
 \sin^2 \theta \cos^2 \theta &= 2
 \end{aligned}$$

(22)

$$\frac{1}{\cos \theta} - \frac{1}{\cot \theta} = \frac{1}{p}$$

$$\text{Sec } \theta - \tan \theta = 1/p$$

$$\text{Sec } \theta + \tan \theta = p$$

$$2\sec \theta = \frac{1}{p} + p = \frac{1+p^2}{p}$$

$$\text{Sec } \theta = \frac{1+p^2}{2p}$$

$$\cos \theta = \frac{2p}{1+p^2}$$

(23)

$$\cosec^6 A - \cot^6 A - 3 \cosec^2 A \cot^2 A$$

$$= \cosec^6 A - \cot^6 A - 3 \cosec^2 A \cot^2 A (\cosec^2 A - \cot^2 A)$$

$$= (\cosec^2 A - \cot^2 A)^3$$

$$= (1)^3 = 1$$

(24)

$$\sqrt{\frac{\sec A - 1}{\sec A + 1}} = \sqrt{\frac{(\sec A - 1)^2}{\sec^2 A - 1}}$$

$$= \frac{\sec A - 1}{\tan A} = \frac{\frac{1}{\cos A} - 1}{\frac{\sin A}{\cos A}} = \frac{1 - \cos A}{\sin A} = \cosec A$$

(25)

$$\tan A = \frac{1}{2}$$

$$\tan B = \frac{1}{3}$$

$$\tan(2A + B) = \frac{\tan 2A + \tan B}{1 - \tan 2A \tan B}$$

$$\text{Also, } \tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$$

$$= \frac{2 \times \frac{1}{2}}{1 - \frac{1}{4}} = \frac{4}{3}$$

$$\tan(2A + B) = \frac{\frac{4}{3} + \frac{1}{3}}{1 - \frac{4}{3} \times \frac{1}{3}} = 3$$

(26)

$$\left[\frac{z}{(\cot A - \tan A)} \right] = \left[\frac{z}{\left(\frac{1}{\tan A} - \tan A \right)} \right]$$

$$= \left[\frac{2 \tan A}{1 - \tan^2 A} \right] = \tan 2A$$

(27)

$$\sqrt{\frac{\cosec A - 1}{\cosec A + 1}} = \frac{\cosec A - 1}{\sqrt{\cosec^2 A - 1}}$$

$$\frac{\cosec A - 1}{\cot A} = \frac{\frac{1}{\sin A} - 1}{\frac{\cos A}{\sin A}}$$

$$= \frac{1 - \sin A}{\cos A} = \sec A - \tan A$$

(28)

$$(\sec^4 A - \tan^2 A) - (\tan^4 A + \sec^2 A)$$

$$= (\sec^4 A - \tan^4 A) - \tan^2 A - \sec^2 A$$

$$= (\sec^2 A + \tan^2 A)(\sec^2 A - \tan^2 A) - \sec^2 A - \tan^2 A$$

$$= \sec^2 A + \tan^2 A - \sec^2 A - \tan^2 A$$

$$= 0$$

(29)

$$\tan 45^\circ + \frac{4}{\sqrt{3}} \sec 60^\circ$$

$$= 1 + \frac{4}{\sqrt{3}} \times 2$$

$$= 1 + \frac{8}{\sqrt{3}}$$

$$= \frac{(\sqrt{3} + 8)}{\sqrt{3}}$$

(30)

$$\sin \theta = 20/29$$

$$\cos \theta = 1 - \sin^2 \theta$$

$$= 1 - (20/29)^2$$

$$= 20/29$$

? Crack with Us...

(31)

$$\text{put } A = 30^\circ$$

$$\cosec 60^\circ + \cot 60^\circ = \frac{2}{\sqrt{3}} + \frac{1}{\sqrt{3}} = \sqrt{3}$$

$$\text{From option } \cot A = 30^\circ = \sqrt{3}$$

(32)

$$= \sin^3 A + \cos^3 B + \tan^3 C - 3 \sin A \cos B \tan C$$

$$= \left(\frac{1}{2} \right)^3 + \left(\frac{1}{2} \right)^3 - 1 - 3 \times \frac{1}{2} \times \frac{1}{2} \times (-1)$$

$$= -\frac{3}{4} + \frac{3}{4} = 0$$

1/2

(33)

$$\text{For least value, We put } \theta = 45^\circ$$

$$= 1 + 1 + \frac{1}{2} + \frac{1}{2} + 2 + 2 \\ = 7$$

$$(34) \quad \left(\frac{1}{\cos A} + \cos A \right) \left(\frac{1}{\cos A} - \cos A \right) \\ \Rightarrow \frac{(1+\cos^2 A)}{\cos A} \cdot \frac{(1-\cos^2 A)}{\cos A} = (1 + \cos^2 A) \cdot \\ = \sin^2 A + \tan^2$$

$$(35) \quad \left(\frac{\operatorname{cosec} A}{\cot A + \tan A} \right)^2 = \left(\frac{\frac{1}{\sin A}}{\frac{\cos A}{\sin A} + \frac{\sin A}{\cos A}} \right)^2 = \left(\frac{\frac{1}{\sin A}}{\frac{\cos^2 A + \sin^2 A}{\sin A \cos A}} \right)^2 = \left(\frac{1}{\sin A} \times \frac{\sin A \cos A}{\cos^2 A + \sin^2 A} \right)^2 \\ = \cos^2 A = 1 - \sin^2 A$$

$$(36) \quad \frac{\frac{\sin A}{\cos A}}{1 - \frac{\sin A}{\cos A}} + \frac{\frac{\cos A}{\sin A}}{1 - \frac{\sin A}{\cos A}} - \frac{1}{\sin A \cos A} \\ = \frac{\sin^2 A}{\cos A(\sin A - \cos A)} + \frac{\cos^2 A}{\sin A(\cos A - \sin A)} - \frac{1}{\sin A \cos A} \\ = \frac{\sin^2 A - \cos^2 A}{\sin A \cos A (\sin A - \cos A)} - \frac{1}{\sin A \cos A} \\ = \frac{(\sin A - \cos A)(\sin A + \cos A)}{(\sin A - \cos A)(\sin^2 A + \cos^2 A + \sin A \cos A) - (\sin A - \cos A)} \\ = \frac{\sin A \cos A (\sin A - \cos A)}{(\sin A - \cos A) \cdot (1 + \sin A \cos A - 1)} \\ = \frac{\sin A \cos A (\sin A - \cos A)}{\sin A \cos A (\sin A - \cos A)} \\ = 1$$

(37)
Opposite sides are equal hence option c

$$(38) \quad \left[\frac{\tan^2 \theta - \sin^2 \theta}{\tan^2 \theta \sin^2 \theta} \right] \\ \left[\frac{\sin^2 \theta}{\cos^2 \theta} - \sin^2 \theta / \tan^2 \theta \sin^2 \theta \right] \\ \left[\left(\frac{\sin^2 \theta (1 - \cos^2 \theta)}{\cos^2 \theta} \right) / \tan^2 \theta \sin^2 \theta \right] \\ \left[\frac{\sin^4 \theta}{\sin^2 \theta \times \sin^2 \theta} \right] \\ = 1$$

$$(39) \quad \sec(3x - 20^\circ) = \operatorname{cosec}(3y + 20^\circ) \\ \sec(3x - 20^\circ) = \sec \\ 3x - 20^\circ = 90^\circ - 3y - 20^\circ \\ x + y = 30^\circ \\ \tan(x + y) = 1/\sqrt{3}$$

$$(40) \quad \cot A = \frac{n}{(n+1)} \\ \cot B = \frac{1}{(2n+1)} \\ \cot(A + B) = \frac{\cot A \cdot \cot B - 1}{\cot A + \cot B} \\ = \frac{\frac{n}{(n+1)} \times \frac{1}{(2n+1)} - 1}{\frac{n}{(n+1)} + \frac{1}{(2n+1)}} \\ = \frac{\frac{n}{(n+1)(2n+1)} - 1}{\frac{n}{(n+1)(2n+1)} + \frac{1}{(n+1)(2n+1)}} \\ = \frac{\frac{n - (n+1)(2n+1)}{(n+1)(2n+1)}}{\frac{n(2n+1) + (n+1)}{(n+1)(2n+1)}} \\ = \frac{n - 2n^2 - n - 2n - 1}{2n^2 + n + n + 1} \\ = \frac{-(2n^2 + 2n + 1)}{2n^2 + 2n + 1} \\ = -1$$

$$(41) \quad (1 - \sin A \cos A)(\sin A + \cos A) \\ = \sin A - \sin^2 A \cos A + \cos A - \sin A \cos^2 A \\ = \sin A - \sin A \cos^2 A + \cos A - \sin^2 A \cos A \\ = \sin A [1 - \cos^2 A] + \cos A [1 - \sin^2 A] \\ = \sin^3 A + \cos^3 A$$

$$(42) \quad \sqrt{\frac{1 - \sin A}{1 + \sin A}} \\ = \sqrt{\frac{1 - \sin A}{1 + \sin A} \times \frac{1 - \sin A}{1 - \sin A}} \\ = \sqrt{\frac{(1 - \sin A)^2}{1 - \sin^2 A}} = \frac{1 - \sin A}{\cos A} \\ = \frac{1}{\cos A} - \frac{\sin A}{\cos A} = \sec A - \tan A$$

$$(43) \quad \sqrt{\frac{1}{\sin^2 A} + \frac{1}{\cos^2 A}} \\ = \sqrt{\operatorname{cosec}^2 A + \sec^2 A} \\ = \sqrt{1 + \cot^2 A + 1 + \tan^2 A} \\ = \sqrt{\tan^2 A + \cot^2 A + 2} \\ = \sqrt{(\tan A + \cot A)^2} = \tan A + \cot A$$

(44)

$$\begin{aligned} & \sin\left(\frac{-\pi}{3}\right) + \cos\left(-\frac{\pi}{6}\right) \\ &= -\sin\left(\frac{\pi}{3}\right) + \cos\left(\frac{\pi}{6}\right) \quad [\because \sin(-\theta) = -\sin(\theta), \cos(-\theta) = \cos(\theta)] \\ &= -\sqrt{3}/2 + \sqrt{3}/2 = 0 \end{aligned}$$

(45)

Since θ is acute angle
 $\& \tan - \cot = 0$
 $\therefore \theta = 45^\circ$
 $\tan^{26} + \cot^{100} = \tan^{26} (45^\circ)^0 + \cot^{100} (45^\circ)^0$
 $= 1 + 1 = 2$

(46)

$$\sin 3\theta \sec 2\theta = 1$$

$$\sin 3\theta = \frac{1}{\sec 2\theta}$$

$$\sin 3\theta = \cos 2\theta$$

$$\sin 3\theta = \sin(90^\circ - 2\theta)$$

$$3\theta = 90^\circ - 2\theta$$

$$5\theta = 90^\circ$$

$$\theta = 18^\circ$$

Now

$$\left[3\tan^2\left(\frac{5\theta}{2}\right) - 1\right]$$

$$\left[3\tan^2\left(\frac{90}{2}\right) - 1\right]$$

$$\left[3\tan^2 45^\circ - 1\right]$$

$$= 3 - 1$$

$$= 2$$

(47)

$$\begin{aligned} & (\cosec A + \sin A)(\cosec A - \sin A) \\ &= \cosec^2 A - \sin^2 A \\ &= 1 + \cot^2 A - 1 + \cos^2 A \\ &= \cot^2 A + \cos^2 A \end{aligned}$$

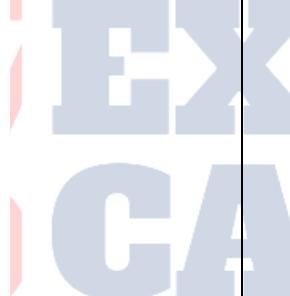
(48)

$$\begin{aligned} & \sqrt{\frac{\sec A (\sec A + 1 + \sec A - 1)}{\tan^2 A}} \\ &= \sqrt{\frac{2 \sec^2 A}{\tan^2 A}} \\ &= \sqrt{2} \cosec A \end{aligned}$$

$$\begin{aligned} (49) \quad & \left[\frac{\cos A}{(1-\tan A)} + \frac{\sin A}{(1-\cot A)} \right]^2 \\ &= \left[\frac{\cos A}{\left(1 - \frac{\sin A}{\cos A}\right)} + \frac{\sin A}{\left(1 - \frac{\cos A}{\sin A}\right)} \right]^2 \\ &= \left[\frac{\cos^2 A}{(\cos A - \sin A)} + \frac{\sin^2 A}{(\cos A - \sin A)} \right]^2 \\ &= \left[\frac{\cos^2 A}{\cos A - \sin A} + \frac{\sin^2 A}{\cos A - \sin A} \right]^2 \\ &= \left[\frac{\cos^2 A - \sin^2 A}{\cos A + \sin A} \right]^2 \\ &= (\cos A + \sin A)^2 \\ &= 1 + \sin 2A \end{aligned}$$

(50)

$$\begin{aligned} & \frac{\cot^2 \frac{A}{2} + \tan^2 \frac{A}{2}}{2} \\ &= \frac{\frac{\cos^2 \frac{A}{2}}{\sin^2 \frac{A}{2}} + \frac{\sin^2 \frac{A}{2}}{\cos^2 \frac{A}{2}}}{2} \\ &= \frac{2 \sin^2 \frac{A}{2} \cos^2 \frac{A}{2}}{\cos^2 \frac{A}{2} + \sin^2 \frac{A}{2}} \\ &= 2 \sin \frac{A}{2} \cos \frac{A}{2} \\ &= \sin A \quad \{ \sin 2\theta = 2 \sin \theta \cos \theta \} \end{aligned}$$



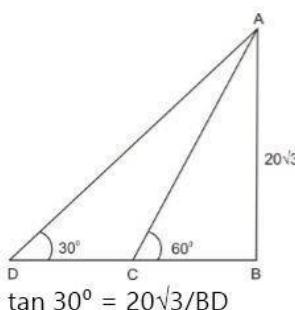
Exams ? Cocks with 1 Is...

$$\begin{aligned} (51) \quad & \left(\frac{1}{\sec A + \tan A} \right)^2 \\ &= \left(\frac{1}{\frac{1}{\cos A} + \frac{\sin A}{\cos A}} \right)^2 \\ &= \frac{\cos^2 A}{(1 + \sin A)^2} = \frac{1 - \sin^2 A}{(1 + \sin A)^2} \\ &= \frac{(1 + \sin A)(1 - \sin A)}{(1 + \sin A)^2} = \frac{(1 + \sin A)}{(1 - \sin A)} \end{aligned}$$

(52)

$$\begin{aligned} & (\cosec^2 A - \cot^2 A) - (\cot^2 A + \cosec^2 A) \\ &= \cosec^2 A - \cosec^2 A - \cot^2 A - \cot^2 A \\ &= \cosec^2 A (\cosec^2 A - 1) - \cot^2 A (1 + \cot^2 A) \\ &= \cosec^2 A \cot^2 A - \cot^2 A \cosec^2 A = 0 \end{aligned}$$

(53)



$$\tan 30^\circ = 20\sqrt{3}/BD$$

$$BD = 60 \text{ m}$$

$$\tan 60 = 20\sqrt{3}/BC$$

$$BC = 20 \text{ m}$$

$$DC = 40 \text{ m}$$

$$\text{Speed of boat} = 40/10$$

$$= 4 \text{ m/sec}$$

$$\text{Total time taken to reach light house}$$

$$= 10 + 20/4$$

$$= 15 \text{ sec}$$

$$(54) \quad \left[\frac{\sec \theta}{(\sec \theta - 1)} \right] + \left[\frac{\sec \theta}{(\sec \theta + 1)} \right] \\ = \frac{\sec \theta (\sec \theta + \sec \theta + 1 - 1)}{\sec^2 \theta - 1} \\ = \frac{2 \sec^2 \theta}{\tan^2 \theta} \\ = 2 \operatorname{cosec}^2 \theta$$

(55)

We know,

$$\operatorname{Sec}^2 A - \tan^2 A = 1$$

Cubing both sides

$$\Rightarrow (\operatorname{Sec}^2 A - \tan^2 A)^3 = 1$$

$$\Rightarrow \operatorname{Sec}^6 A - \tan^6 A - 3\operatorname{Sec}^2 A \cdot \tan^2 A (\operatorname{Sec}^2 A - \tan^2 A) = 1$$

$$\Rightarrow \operatorname{Sec}^6 A - \tan^6 A - 3\operatorname{Sec}^2 A \cdot \tan^2 A = 1$$

(56)

$$(\operatorname{cosec} A - \sin A)(\operatorname{sec} A - \cos A)(\tan A + \cot A) \\ = \left(\frac{1}{\sin A} - \sin A \right) \left(\frac{1}{\cos A} - \cos A \right) \left(\frac{\sin A}{\cos A} + \frac{\cos A}{\sin A} \right) \\ = \left(\frac{1 - \sin^2 A}{\sin A} \right) \left(\frac{1 - \cos^2 A}{\cos A} \right) \left(\frac{\sin^2 A + \cos^2 A}{\sin A \cos A} \right) \\ = \frac{\cos^2 A}{\sin A} \times \frac{\sin^2 A}{\cos A} \times \frac{1}{\sin A \cos A} \\ = 1$$

(57)

$$\cos^4 A - \sin^4 A$$

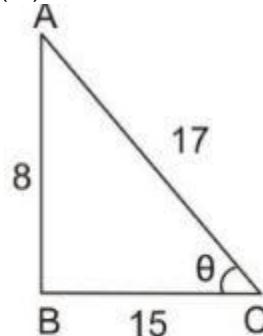
$$= (\cos^2 A)^2 - (\sin^2 A)^2$$

$$= (\cos^2 A + \sin^2 A)(\cos^2 A - \sin^2 A)$$

$$= \cos 2A$$

$$(61) \quad \tan 60^\circ + \operatorname{cosec} 60^\circ \\ = \sqrt{3} + 2/\sqrt{3} = 5/\sqrt{3}$$

(62)



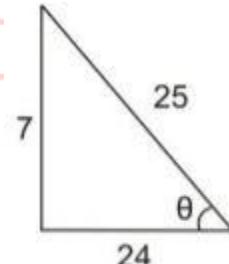
$$\operatorname{cosec} \theta = 17/8 = h/p$$

$$\cos \theta = b/h = 15/17$$

(63)

$$\frac{1}{\sqrt{2}} \times \operatorname{cot} 45^\circ + \frac{1}{\sqrt{3}} \times \operatorname{cosec} 60^\circ \\ = \frac{1}{\sqrt{2}} \times 1 + \frac{1}{\sqrt{3}} \times \frac{2}{\sqrt{3}} \\ = \frac{1}{\sqrt{2}} + \frac{2}{3} = \frac{3+2\sqrt{2}}{3\sqrt{2}}$$

(64)



$$\tan \theta = P/R = 7/24$$

$$\therefore \operatorname{sec} \theta = H/B = 25/24$$

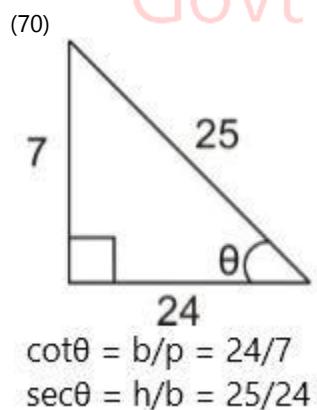
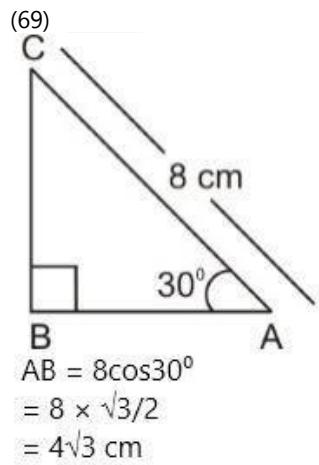
(65)

$$\sqrt{2} \operatorname{sec} 45^\circ - \tan 30^\circ \\ = \sqrt{2} \times \sqrt{2} - \frac{1}{\sqrt{3}} \\ = 2 - \frac{1}{\sqrt{3}} \\ = \frac{(2\sqrt{3}-1)}{\sqrt{3}}$$

$$\begin{aligned}
 (66) \quad & \Rightarrow \frac{1}{\sqrt{3}} \operatorname{cosec} 30^\circ \\
 & = \frac{1}{\sqrt{3}} \times 2 \\
 & = \frac{2}{\sqrt{3}}
 \end{aligned}$$

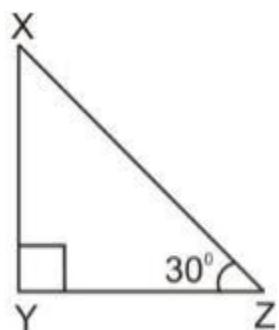
$$\begin{aligned}
 (67) \quad & \operatorname{cosec} \theta = 25/7 \\
 & \therefore \cot \theta = 24/7
 \end{aligned}$$

$$\begin{aligned}
 (68) \quad & = \cot 60^\circ - \sec 30^\circ \\
 & = 1/\sqrt{3} - 2\sqrt{3} \\
 & = -1/\sqrt{3}
 \end{aligned}$$

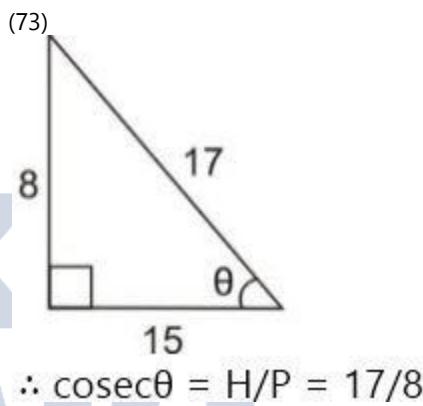


$$\begin{aligned}
 (71) \quad & \sqrt{2} \times \sec 45^\circ + 1/\sqrt{3} \tan 30^\circ \\
 & = \sqrt{2} \times \sqrt{2} + 1/\sqrt{3} \times 1/\sqrt{3} \\
 & = 2 + 1/3 = 7/3
 \end{aligned}$$

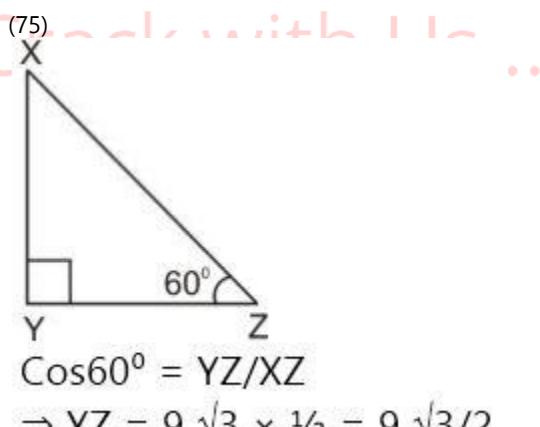
(72)



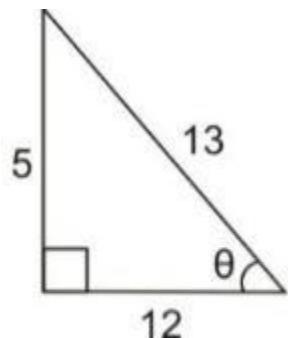
$$\begin{aligned}
 \cos 30^\circ &= YZ/XZ \\
 \Rightarrow YZ &= \sqrt{3}/2 \times 9 = 9\sqrt{3}/2
 \end{aligned}$$



$$\begin{aligned}
 (74) \quad & \sin 30^\circ - \sqrt{2} \cos 30^\circ \\
 & = 1/2 - \sqrt{2} \times \sqrt{3}/2 = 1 - \sqrt{6}/2
 \end{aligned}$$



(76)



$$\sec \theta = H/B = 13/12$$

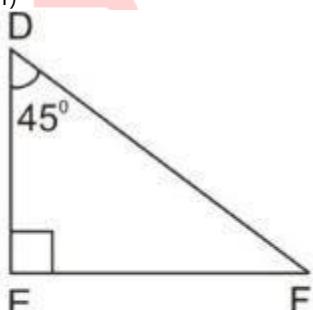
$$\therefore \sin \theta = 5/13$$

(80)

Put the value -

$$1/2 \times 2/\sqrt{3} + \sqrt{2} \cdot \sqrt{3} = 1/\sqrt{3} + \sqrt{6} = 1+3\sqrt{3}/\sqrt{3}$$

(81)



$$\Rightarrow \operatorname{cosec} F \times \cot D$$

$$D = 45^\circ$$

$$\Rightarrow \operatorname{cosec} 45^\circ * \cot 45^\circ = \sqrt{2} \times 1 =$$

(82)

$$\sec \theta = 25/24$$

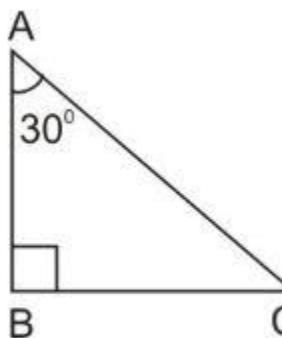
We know the triplet = (7, 24 & 25)

$$\text{So, } \sin \theta = 7/25$$

(83)

$$\sin 30^\circ + \cos 30^\circ = \frac{1}{2} + \frac{\sqrt{3}}{2} = (1+\sqrt{3})/2$$

(84)



$$\sec C = \sec 60^\circ = 2$$

(85)

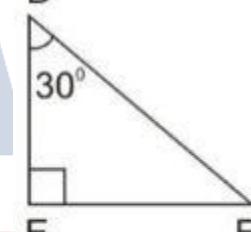
$$\sin \theta = 12/13, \text{ then } \cot \theta = 5/12$$

(86)

$$\text{After putting value } \Rightarrow 1 - \frac{1}{\sqrt{3}} \times 2 \Rightarrow \frac{\sqrt{3}-2}{\sqrt{3}}$$

$$= \left(\frac{3-2\sqrt{3}}{3} \right)$$

(87)



$$\Rightarrow EF = 6\sqrt{3}$$

$$\tan 30^\circ = \frac{EF}{DE} \Rightarrow DE = \frac{6\sqrt{3}}{\frac{1}{\sqrt{3}}} = 18$$

(88)

$$\sin \theta = 20/29, \sec \theta = 29/21$$

Triplet, (20,21,29)

20 perpendicular

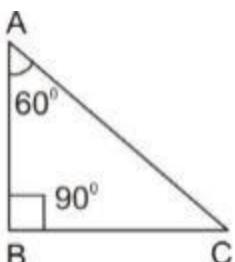
29 diagonal (height)

21 base

(89)

$$2 \cdot \sqrt{2} + \frac{1}{\sqrt{3}} \Rightarrow \left(\frac{2\sqrt{6}+1}{\sqrt{3}} \right)$$

(90)



$$\cot C = \cot 30^\circ = \sqrt{3}$$

(91)

$$\operatorname{cosec} \theta = 25/7$$

We know that,

Triplet = (7, 24, 25)

$$\cos \theta = (24/25)$$

(92)

$$\cot 60^\circ - \sec 45^\circ$$

$$= \frac{1}{\sqrt{3}} - \sqrt{2}$$

$$= \frac{\sqrt{3}}{3} - \sqrt{2}$$

$$= \frac{\sqrt{3}-3\sqrt{2}}{3}$$

(93)

$$\angle ACB = 60^\circ$$

$$\frac{AB}{AC} = \sin 60^\circ$$

$$AB = 10 \times \frac{\sqrt{3}}{2}$$

$$AB = 5\sqrt{3} \text{ cm}$$

(94)

$$\cot \theta = \frac{\text{Base}}{\text{perpendicular}} = \frac{24}{7}$$

$$\therefore \sin \theta = 7/25$$

(95)

$$\sec 30^\circ + \tan 60^\circ$$

$$= 2/\sqrt{3} + \sqrt{3}$$

$$= 5/\sqrt{3}$$

(96)

$$\angle P = 180^\circ - 90^\circ - 30^\circ = 60^\circ$$

$$\therefore \cot \angle P = \cot 60^\circ$$

$$= 1/\sqrt{3}$$

(97)

$$\sec \theta = H/B = 5/3$$

$$\therefore \operatorname{cosec} \theta = H/P = 5/4 = 1.25$$

(98)

$$\sin 30^\circ - \operatorname{cosec} 45^\circ$$

$$= 1/2 - \sqrt{2}/2$$

$$= 1 - 2\sqrt{2}/2$$

(99)

$$MN/NL = \cos 45^\circ$$

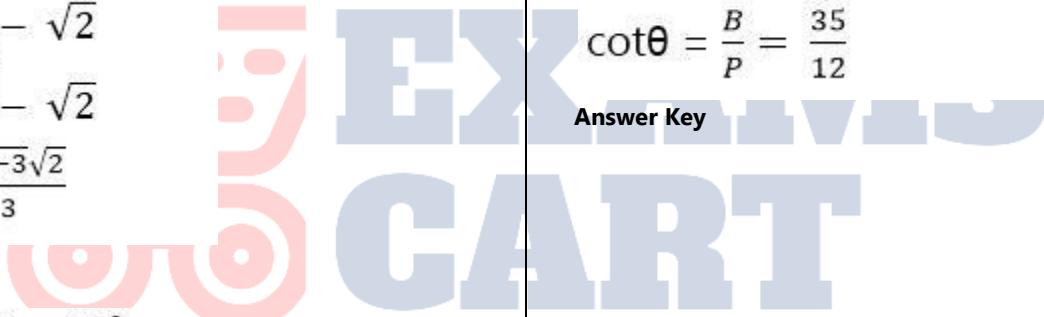
$$MN = 9\sqrt{2} \times 1/2 = 9 \text{ cm}$$

(100)

$$\cos \theta = \frac{B}{H} = \frac{35}{37}$$

$$P = \sqrt{H^2 - B^2} = \sqrt{37^2 - 35^2} = 12$$

$$\cot \theta = \frac{B}{P} = \frac{35}{12}$$

Answer Key

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